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has in return received *Aphantostephus Arizonicus* and *Schkuhria Hopkirkia.* But most marked of all is the interchange of species along the line of the forest-belt. The resemblance between the flora of the Mogollones of South-western New Mexico, where the summer of 1881 was chiefly passed, and that of the San Francisco and Mogollones of Arizona, where I staid in 1883, was very striking. Among the most conspicuous species in the vicinity of Clairmont, N. M., were *Pentstemon linarioides*, *Actinella Rusbyi*, *Hymenopappus Mexicanus* and *Aster canescens*, with *Helenium Hoopesii* at a higher altitude. About Flagstaff, A. T., the same species abounded, imparting a striking similarity to the landscape. *Senecio Rusbyi* was also here rediscovered and is probably to be found all the way down the highland to the New Mexican Mogollones. *Cupressus Arizonica* also follows the western side of this highland to Southern Arizona, but has not yet appeared from New Mexico. It may be added that those very interesting Mogollon Mountains of New Mexico are also very intimately connected south-westward with the mountains of Southern Arizona, from which source they have received *Galium Rothrockii*, *Stevia Plummeræ*, *Primula Rusbyi*, *Brickellia floribunda* and *B. oliganthes.*

H. H. Rusby.

Notes on New England Marine Algæ, IV.—The following species have not before been reported from New England, and all with the exception of *Ulva marginata*, found by Prof. Farlow in algæ from Salt Lake, Utah, are, as far as I know, new to the United States.

Microchæte grisea, Thuret, Notes Algologiques, Plate xxx. On an old pecten shell at West Falmouth, Mass., in company with *Calothrix crustacea*, Thuret. Resembling a small *Calothrix*, from which it differs in having no terminal hair, the trichome ending in a rounded cell instead of a point; known heretofore only on the coast of France. I am indebted to Dr. E. Bornet for the identification of this plant.

Nodularia litorea (Kütz.), Thuret. A few filaments among *Lyngbyæ*, *Ulvæ*, *Calothrix*, etc., in marshes at Hampton, N. H., in company with *N. Harveyana*, Thuret; the filaments are about twice the diameter of those of the latter species. Figured in Notes Algologiques, Plate xxix.

Rhizoclonium (*Linum*), Thuret. I have found at Kennebunkport, Maine, Hampton, N. H., and Nahant, Mass., a plant which agrees with authentic specimens of this species from Cherbourg, France. The filaments are from .10 to .12 $^{\text{mm.}}$ in diameter, and often much curled and twisted. It seems quite distinct from the *Chætomorpha Linum* of Farlow's Manual, which is about twice this diameter, and resembles rather *Rhizoclonium tortuosum*, which, however, is only half its size.

Chætophora maritima, Kjellman, Spetsbergens Thallophyter, Plate v., Figs. 15 and 16. At Kennebunkport, Maine, I found in an upper tide-pool, growing in a dense mass of *Calothrix scopulorum*, Ag., *Oscillariæ*, etc., a few filaments agreeing with Kjellman's description and plate. They did not, however, form a definite thallus, and if they belong to this species are probably a reduced form, growing at its extreme southern limit; probably farther north and east it would be found more fully developed.

Ulva percursa, Ag., (*Enteromorpha percursa*, J. Ag.) Growing in upper tide-pools at Kennebunkport, Maine, Hampton, N. H., and Cohasset, Mass., and probably common in tide-pools and marshy places along the coast. It is undistinguishable by the naked eye from the various *Ulvæ* and *Rhizoclonia* found in similar localities, but is easily recognized on microscopic examination by the frond composed of two longitudinal series of symmetrical cells. It is figured in Areschoug, Phycæ Scandinavicæ Marinæ, Part 2, Plate ii. A.

Ulva marginata, LeJolis. (*Enteromorpha marginata*, J. Ag.) Weymouth and Quincy, Mass., growing on woodwork; distinguished by its dark green, narrow, slightly branched, flattened frond, composed of a few longitudinal series of small, elongated cells, the marginal series differing somewhat in depth of color from the central. This is the *Ulva* referred to in my note in the BULLETIN of March, 1884.

Ulva aureola, Ag. (*Enteromorpha aureola*, Kütz.) Growing in small quantities among *Ulvæ*, *Lyngbiæ*, *Rhizoclonia*, etc., in the marshes at Hampton, N. H. The cells, which are arranged in longitudinal series, look like a *Glœocapsa*. Figured in Hauck, Die Meeresalgen Deutschlands, Fig. 190.

Myrionema orbiculare, J. Ag. On *Zostera marina*, Kennebunkport and Hampton. Differs from the common *M. vulgare*, Thuret, by the presence of peculiar, saccate, hair-like growths, in addition to the usual hairs and paraphyses. Figured in Hauck, Meeresalgen, Fig. 132. I am indebted to Prof. J. G. Agardh for the identification of this species, and for valuable assistance in determining various forms of the Ulvaceæ.

Porphyra coccinea, J. Ag. On *Desmarestia aculeata*, Lamour., at Hampton, N. H. A very delicate alga, with a thinner frond and much smaller cells than any other American *Porphyra*. I found it only once, a floating plant of *Desmerestia* being pretty well covered with the delicate fronds, which, when lifted out of the water, collapsed like one of the finer Callithamnions. Figured in Agardh, Till Algernes Systematik, vi., Plate ii., Figs. 41-43.

Porphyra miniata, Ag. The Nahant plant which I mentioned in the BULLETIN for May, 1882, under the name of *P. leucostica*, Thuret, seems to belong rather to this species. I have since found it at Kennebunkport and at Hampton, at both of which places it seems to be not uncommon in the summer, growing on other algæ, or washed up from below low-water mark. The antheridia do not form patches of any considerable size, but are scattered in groups of a few cells throughout the frond. This is a characteristic arctic species, and adds another to the list of extreme northern species that have been found extending quite a distance south on the American coast. Its occurrence in the same locality with *Dasya elegans*, Ag., is a curious instance of the meeting of northern and southern forms in Massachusetts Bay. *P. miniata* is figured in Agardh, Till Algernes Systematik, vi., Plate ii., Figs. 44-48.

I have received what appears to be the true *P. leucosticta* from

Rev. J. D. King, collected at Cottage City, Mass., and from Mr. S. R. Morse, collected at Atlantic City, N. J.

Kallymenia reniformis, Ag. A single specimen, with cystocarpic fruit, washed ashore at Revere Beach, Mass., April 27th, 1884. In appearance it much resembles some forms of *Rhodymenia palmata*, Grev., but the color is a somewhat different shade of red; the microscopic structure is quite distinct. It is figured in Harvey, Phycologia Britannica, Plate xiii., and has not been previously recorded as found outside of northern Europe.

FRANK S. COLLINS.

Corema Conradii.—Much may be done towards elucidating the probable origin and past history of our native plants, by carefully tracing their local and geographical distribution in the way Mr. John H. Redfield has done in his interesting paper on *Corema Conradii* in the TORREY BULLETIN for September, p. 97. As the details given under the head of "Nova Scotia and Newfoundland" are meagre, and Mr. Redfield appeals to botanical brethren in the British Provinces for further facts, I cannot well resist contributing my mite, notwithstanding the supplementary records in the October number, some of which relate to this Province.

In the spring of 1864, soon after my arrival in Nova Scotia, I found the *Corema* blooming abundantly on a bare ridge of quartzite rock, eleven miles to the north of Halifax city. Wherever there was a crevice or crack in the rock there were tufts of *Corema*, with stiff wiry stems. It was about the only flowering-plant on these barren rocks. I soon found that the *Corema* was not rare in the district, and could discern it in heath-like tufts on the bare rocky hills from the railway cars, in many places. The auriferous quartzite rocks to which I refer stretch along the Atlantic coast district of Nova Scotia throughout nearly its whole extent. Wherever they are bare enough to resist more leafy plants, *Corema* is apt to be found. It is usually associated with *Vaccinia*, *Cornus Canadensis Gaultheria procumbens*, *Polypodium vulgare*, and, less frequently, *Arctostaphylos Uva-ursi*. On level ground, where the soil is very poor, consisting of gravel or sand, the *Corema* also occurs, not only in our Atlantic Coast district, but in other parts of the Province; in such situations it does not grow in distinct tufts, but becomes more gregarious, exclusively occupying large areas, and is usually much dwarfed in growth, the stems being often only a very few inches high. I shall endeavor next summer, by aid of my students and correspondents, to trace the distribution of *Corema* throughout this Province with more exactness.

In Nova Scotia the *Corema* has been so often mistaken for Scotch heather (*Calluna*) that I have frequently wished it were less abundant. Compared with *Corema*, *Empetrum nigrum* is, with us, comparatively rare.

Dalhousie College and University, Halifax. GEORGE LAWSON.

Big grape-vines.—In the BULLETIN for February, 1882, I gave a statement of a grape-vine I had visited and measured at Baisden's Bluff near Darien, Ga. There were two errors in the accouut, which